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Conference Abstract

SiBBr: Envisioning the spatial distribution of Brazilian biodiversity records

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Abstract

Habitat degradation and fragmentation has driven much of the extinction process of current species. Biodiversity loss compromises ecosystems goods and socioeconomic activities, and can be managed through holistic conservation policies that prioritize where and how to spend efforts and resources. Hence an easy-to-use information tool that crosses biodiversity data with geographical locations is key for the development of effective conservation policies. The Brazilian Biodiversity Information System (SiBBr), a government initiative and the Brazilian node of the Global Biodiversity Information Facility (GBIF), aim to consolidate biodiversity primary data in one platform, making it available for researchers and policymakers over the internet through several tools to facilitate and disseminate the analysis and use of biodiversity data.

Because macroecological or biodiversity-related phenomena usually occur in geographically delimited spots, showing the correlation of factors that favor their establishment, spatial tools to test and describe such geospatial relationships are required. Unfortunately, most of methods to evaluate gains and losses of biodiversity and to establish future scenarios require specialized skills with GIS software, combined with the knowledge of how to apply conservation methodologies with this tool.

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The term Spatial Data Infrastructure (SDI) denotes a framework of technologies, policies and institutional arrangements, which facilitates the creation, exchange and use of geospatial data along with related information resources across an information-sharing community. Such a framework can be implemented narrowly to enable the sharing of geospatial information within an organization, or more broadly for use at a regional, national or global level. In all cases, an SDI provides an institutionally-sanctioned, automated means for posting, discovering, evaluating and exchanging geospatial information by participating data producers and consumers.

SiBBr's SDI brings together political and institutional arrangements, through the Open Geospatial Consortium (OGC), associated with a service-oriented architecture (SOA) required to acquire, process, store, distribute and optimize the use and research of published data at SiBBr. In an SOA environment, network nodes make their resources available to other nodes through independent services, all of which have standardized access via service metadata. To communicate, these services are based on a formal definition that is independent of underlying platform and programming language.

To optimize the use of data, SiBBr's SDI is founded on two pillars:

- Metadata Search: SiBBr's SDI metadata catalog allows search through available datasets without the need of downloading or uploading data, to request the appropriate data for the objectives of each user.
- Visualization of databases: through SiBBr's SDI viewer, users can examine the databases of occurrences published at SiBBr, combine them with various biodiversity data from other sources simultaneously – without the need to download unwanted intermediate data – and perform spatial analysis. Based on free access to data, SiBBr's SDI always provides the latest version of the data published on its platform.

SiBBr's SDI also allows users to obtain a final analysis product or to generate appropriate inputs to be used in biodiversity modeling software by combining layers and performing singular or combined operations (buffer, intersection, difference, union and dissolve) through processing routines. Therefore, SiBBr's SDI allows users at different skill levels with GIS tools to perform spatial analyses that can contribute to the greater use and production of data suitable for biodiversity conservation research and policymaking.

Keywords

The Brazilian Biodiversity Information System (SiBBr), biodiversity modeling, Spatial Data Infrastructure (SDI), spatial analysis, occurrence data, biodiversity layers

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